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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,249

09/15/2006

Tetsuo Yazawa

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10/07/2010

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EXAMINER

BERNS, DANIEL J

ART UNIT

PAPER NUMBER

1734

NOTIFICATION DATE

DELIVERY MODE

10/07/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/593,249	Applicant(s) YAZAWA ET AL.	
	Examiner DANIEL BERNIS	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Preliminary Comment on Claim Interpretation

2. Independent claim 1 is written in ‘product-by-process’ format. Since it has been held that the patentability of a product and its method of production are determined separately, claim 1’s “after treatment with hydrogen fluoride” process limitation has not been accorded patentable weight. *See In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985), *In re Brown*, 173 USPQ 688, 688 (CCPA 1977), *In re Fessman*, 180 USPQ 324,326 (CCPA 1977); MPEP 2113.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. In considering the obviousness rejections below, the applicant should note that the person having ordinary skill in the art has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in the application reasonably reflect this level of skill.

7. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2004/290747 (published 10/21/04) (“’747”)¹. Regarding claim 1, ‘747 teaches a photocatalyst comprising artificial quartz crystal. *See* ‘747 at par. 11 and 12 (use of commercial/industrially-marketed quartz, i.e., GE124, implies artificial/synthetic quartz)². While ‘747 does not teach a specific example employing *particles* thereof as claimed, ‘747 does suggest the suitability of its artificial quartz photocatalyst in grain or powdered form, satisfying the claim. *See id.* at par. 13.

NOTE: notwithstanding the fact that claim 1’s “after treatment with hydrogen fluoride” limitation has not been accorded patentable weight as stated above, ‘747 also teaches the treatment of its quartz with HF_(aq) solution. *See id.* at par. 11, 12 and 40³.

¹ NOTE: Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. *See* MPEP § 201.15.

² Given the varied, high-temperature applications within which such quartz products as GE124 are commonly known to be employed, it would be unreasonable to presume that such quartz would be sold and employed in raw, natural form, without any purification or assays being performed thereon prior to market.

³ While ‘747 appears to suggest powdering its quartz after the activation step, *see id.* at par. 13, it nevertheless would have been obvious to one of ordinary skill in the art at the time the invention was made to conduct the activation step *after* powdering ‘747’s quartz particles, given the well-known fact that increased surface areas (i.e., as the result of powdering the quartz) go hand-in-hand with increased mixing (i.e., with the HF_(aq) solution): increased quartz activation would be a reasonably expected and advantageous result thereof. *See also* the rejection of claim 4 over ‘747. NOTE: Examiner’s discussion of ‘747’s coverage of the foregoing quoted process limitation within claim 1 is provided for applicant’s reference only- *no* waiver of the withholding of patentable weight therefrom shall be inferred thereby.

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Regarding claims 2 and 3, '747's suggestion of powdering its photocatalyst implies particle diameters as claimed- the common perception of a "powder" (*see* '747 at par. 13) necessarily connotes particles of <2.0 mm diameter.

Regarding claim 4, '747 teaches the production of its photocatalyst by activating its artificial crystalline quartz in HF_(aq) solution. *See id.* at par. 11, 12 and 40. While '747 appears to suggest powdering its quartz after the activation step, *see id.* at par. 13, it nevertheless would have been obvious to one of ordinary skill in the art at the time the invention was made to conduct the activation step *after* powdering '747's quartz particles, given the well-known fact that increased surface areas (i.e., as the result of powdering the quartz) go hand-in-hand with increased mixing (i.e., with the HF_(aq) solution): increased quartz activation would be a reasonably expected and advantageous result thereof.

Regarding claim 5, '747 teaches an environmental pollutant detoxification method comprising contacting the gaseous and/or liquid pollutant with its photocatalyst under oxidizing conditions and in the presence of activating light irradiation. *See id.* at par. 14-20 and 42-44; Table 1.

8. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over '747 in view of JP 2004/290748 (published 10/21/04) ("748")⁴. Regarding claims 1-5, '747's teachings are as above. Regarding claim 6, '747 teaches that its detoxification contacting step is conducted in the presence of a fluid such as water. *See* '747 at par. 18. The difference between said claim and '747 is that the latter fails to explicitly teach the detoxification of a *nitrogen oxide pollutant* in the presence of water, as required by the claim. This limitation, however, is taught by '748.

⁴ *See* fn. 1, above.

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'748 teaches a photocatalyst comprising artificial quartz crystal, similar to '747's. *See* '748 at par. 9 and 10 (use of commercial/industrially-marketed quartz, i.e., GE124, implies artificial/synthetic quartz)⁵. '748 likewise suggests the suitability of its artificial quartz photocatalyst in grain or powdered form. *See id.* at par. 11. '748 further teaches the suitability of its photocatalyst for destroying NO_x pollutants, stating that its particular photocatalyst is active through a wider irradiation wavelength range than comparable photocatalysts such as TiO₂-based species and is less expensive than zeolitic/noble metal species. *See id.* at par. 2, 4, 12-16 and 44-48; Table 1. '747 also teaches such a wider activity range for its photocatalyst, similar to '748's. *See* '747 at par. 4, 5, 8-10 and 16. Given the foregoing, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a catalyst such as '747's to detoxify/destroy pollutants such as NO_x for such advantages as lower cost and wider wavelength range activity as taught by '748.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL BERNIS whose telephone number is (571)270-5839. The examiner can normally be reached on Monday thru Thursday, 9AM-6PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached at (571)272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. B./ September 28, 2010

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⁵ *See* fn. 2, above.

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/Timothy C Vanoy/

Primary Examiner, Art Unit 1793